Methods: Radiation doses to a simulated operator were measured with a digital dosimeter (#9010, RadCal Corp., Monrovia, CA). The mock patient was a 97.5 kg fission product phantom (ID # PL-201, Dept. of Energy, Idaho Falls, ID). The simulated procedure included 6 min. of fluoroscopy time and 32 sec. of cineangiography time at 15 frames/sec. Operator exposure was measured at the center of the chest when positioned 2 ft. toward the feet from the patient's groin. Control measurements were performed with the operator at the level of the groin. A disposable radiation drape (Angiosystems, Ducktown, TN) was also used to assess its impact on exposure.
Results: Increasing the distance from the radiation source led to a 78.65% reduction in operator exposure. The radiation drape resulted in a further 22.14% incremental reduction. ($p<0.0001$) Together, both interventions decreased exposure by 83.38%. (Table)

Total doses of operator radiation exposure and the effect of distance and radiation drape on radiation reduction.

	Control (mGy/cm^2)	Distance (mGy/cm^2)	Distance + Drape (mGy/cm^2)
Center of Chest	371.35	105.50	96.65
LAO 30 CRAN 0	279.45	60.20	36.80
RAO 30 CRAN 0	115.40	27.10	27.70
LAO 30 CAUD 30	148.75	123.10	104.35
RAO 0 CAUD 30	157.05	60.90	55.45
LAO 30 CRAN 30	1432.00	153.60	85.10
RAO 30 CRAN 30	177.00	41.90	39.55
Total Radiation	**2681.00**	**572.30**	**445.60**
Incremental Reduction		**78.65%**	**22.14%**
Total Reduction			**83.38%**

Conclusion: Increased distance from the source and use of a drape offered highly significant reduction in operator radiation exposure in a simulated laboratory environment. Though clinical confirmation is warranted, this work contributes to a growing body of literature on minimizing radiation exposure to the operator during transradial catheterization.

TCT-517

Safety and Efficacy of Ulnar Approach. A New Route for Cardiac Catheterization and Intervention

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Background: The transradial approach for coronary diagnostic and therapeutic interventions is a well-established alternative to the conventional femoral approach and is now widely used in catheterization laboratories worldwide. However, the radial approach does not seem suitable for 5–15% of patients undergoing cardiac catheterization. For that reason the ulnar approach is a new available route to consider for cardiac catheterization and intervention.
Methods: The aim of the present prospective study is to assess the safety and efficacy of the transulnar approach for routine use when performing cardiac diagnostic and therapeutic interventions. Between September 2010 and May 2011, 224 consecutive patients referred for diagnostic coronary angiography and/or angioplasty were screened for ulnar access eligibility. 24 hrs. post-procedure Doppler Ultrasound (USG) has been performed in 80% of the cases.
Results: Among 224 consecutive patients referred for diagnostic coronary angiography and or angioplasty and screened for appropriateness of the ulnar approach, 209 (209 of 224, 93.3%) underwent attempted ulnar artery catheterization, which was successful in 198 (198 of 209, 94.7%). Of the 11 failures, 4 (36.3%) were switched to radial and 7 (63.6%) to femoral. Of the 198 successful procedures via the ulnar approach 90 (45.4%) were diagnostic coronary angiographies, 34 (17.1%) left-right heart cardiac catheterizations, 2 (1%) septal ablations, 72 (36.3%) coronary angiographies followed by angioplasty. Access site complications consisted of five cases (2.5%) of silent ulnar artery thrombosis evidenced by Doppler USG, 13 (6.5%) small's hematomas (less than 5 cm by USG) and one large (0.5%),> 5 cm hematoma without neurovascular compromise. No ulnar nerve injury or AV fistulas were evidenced. One pseudoaneurysm (0.5%) was visualized by USG. Three cases (1.5%) of severe reversible ulnar spasm were managed with nitroglycerin, verapamil and sedation. 100% of the procedures were accomplished by this route once the procedure was started.
Conclusion: To our knowledge this is the largest series evaluating the feasibility and effectiveness of the transulnar approach. The results confirm that this innovative and excellent route is feasible and safe for routine coronary diagnostic studies and therapeutic interventions.

TCT-518

Radial versus Femoral access approaches in percutaneous coronary intervention of patients receiving bivalirudin. On behalf of the EUROVISION Investigators. Martial Hamon, Christopher Nienaber, Stefano Galli, Janusz Lipiecki, Kurt Huber, Britta Goldmann, Dietrich Gulba, Debra Bernstein, Efthymios Deliargyris

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Background: Radial access has been associated with reductions in bleeding complications during PCI, primarily due to reductions in access site bleeding. Bivalirudin monotherapy has been shown to reduce both access and non-access site bleeding. The impact of radial versus femoral access choice in patients undergoing PCI with bivalirudin monotherapy is largely unknown.
Methods: Eurovision is a prospective observational study conducted in 58 European sites to track utilization patterns of bivalirudin during PCI. In hospital and 30-day outcomes in 1933 consecutive patients were compared according to access site choice (1353 Femoral versus 580 Radial).
Results: There were no differences noted in ischemic events (death, MI, stroke and urgent revascularization) at 30 days between the two groups. Rates of major bleeding at 30 days were also similar (femoral 1.7%, radial 1.2%, p=0.42). A significant reduction in minor bleeding with radial access was found (femoral 4.8%, radial 1.9%, p=0.0026). At multivariate analysis the sole independent predictor of ischemic events was congestive heart failure (OR 2.8, 95% CI 1.3 to 5.9, p=0.006), the strongest independent predictor of major bleeding was renal impairment (OR 3.4, 95% CI 1.7 to 6.8, p = 0.001), while the independent predictors of minor bleeding were age>65 years (OR 2.03 95% CI 1.2 to 3.4, p=0.009), hypertension (OR 2.9, 95% CI 1.4 to 6.02) and radial access (OR 0.41 95% CI 0.21 to 0.79, p=0.008).
Conclusion: In the context of bivalirudin monotherapy during PCI, both ischemic and major bleeding complication rates at 30 days were similar irrespective of a femoral versus radial access site choice. The choice of radial access, however, was associated with lower rates of both minor and access site bleeding.

TCT-519

Radial vs. Femoral Access in Patients Referred for Primary Percutaneous Coronary intervention: Characteristics and Clinical Outcomes

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Background: Although a recent randomised clinical trial comparing radial vs. femoral approach did not show any difference in clinical outcome in patients with acute coronary syndrome, a subgroup analysis of patients with ST-elevation myocardial infarction (STEMI) showed a superiority of the radial access to reduce serious adverse events. Therefore, we aim to determine in a real-life cohort the characteristics and outcomes of STEMI patients referred for primary percutaneous coronary intervention (PCI) according to arterial access.
Methods: Five-hundred-and-fifty-three consecutive patients with STEMI treated with primary PCI from January 2008 to December 2009 were prospectively followed
Results: The mean age was 61±13 years with a predominance of male (75%), 16% diabetics, 42% anterior MI and 88% Killip class 1. The median door-to-balloon (DtB) was 97 [interquartile range:80,125] minutes. The arterial access was femoral in 24% (n=132) and radial in 76% (n=420). The femoral group had more females (34% vs. 23%; p=0.017), previous CABG (7% vs. 0%; p<.001), chronic renal failure (11% vs. 2%; p<.001), anterior MI (50% vs. 39%; p= 0.033) and high (>1) killip class (30% vs. 6%; p<.001) compared to radial group. Of note, 38% (n=50) of patients in the femoral group had a radial access attempt. Usage of GIIb/ IIIa glycoprotein inhibitors was lower in the femoral group (49% vs. 60%; p=0.034). No difference was found in the median DtB time 100 [85,120] vs. 95 [78, 126]; p=0.260) or the final TIMI 3 flow between the two groups (93% vs. 95%; p=0.158). During the in-hospital follow-up, the femoral group had a higher incidence of death (14% vs. 1%; p<.001) and major bleeding (12% vs. 2%, p<.001).
Conclusion: In centers where the radial approach is usually privileged, patients treated with trans-femoral primary PCI had a high rate of co-morbidities and therefore had a higher rate of in-hospital adverse events. In STEMI patients, using the radial approach significantly decrease the risk of bleeding and serious events. Further randomized studies are warranted to compare between both approaches in this high risk population.

TCT-520

Transradial Approach To Coronary Interventions:How Steep Is The Learning Curve For Trained Interventional Cardiologists?

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Background: US physicians have been reluctant to incorporate the transradial approach(TRA) as part of their practice due to the perception of a more technically demanding procedure and lack of adequate training. Although some reports suggest that 50 TRA procedures is an adequate number to be considered proficient, there is limited information exists about the learning curve of this procedure from already trained interventional cardiologists (IC) without TRA exposure. The aim of the present study was to determine the learning curve of TRA in already trained IC not previously exposed to TRA.
Methods: The learning curve of three IC in TRA was evaluated prospectively and determined by the pre-specified measurement of access time, procedure time, fluoro time, and contrast utilization. Patients with prior CABG or STEMI were excluded. Fifty consecutive cases from a trained TRA operator (Op)[>500 TRA and >10%/year TRA] was used as control. Proficiency was defined as reaching times within 90% percentile of the control Op.
Results: Table shows data during first 50 TRA (*p<0.05 vs control). Goals for fluoro time remained in the 50-60% in Op 1 and Op 2 at 100 TRA cases reaching 75% at procedure 150. Procedure time and contrast goals were achieved in Op 1 and Op 2 at 100 cases. Op 3 reached consistent 75% fluoro time, contrast and procedure time goals

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